A LIST OF THE MOSQUITOES OF THE DISTRICT OF COLUMBIA.¹

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The earliest reference to a species of mosquito in the District of Columbia appears to be that of Warden (1816, p. 167) who wrote:

"Two insects abound in this place, (the estate of Harrison Smith) and torment the lovers of nature; the wood-louse and mosquito (Culex pipiens, L.)... The bite of the mosquito also creates inflammation, and it annoys the ear of the pensive or studious by its unpleasant buzz."

Since at that time only three of the species now know to occur here had been described, (Culex pipiens L., Aedes aegypti (L.), and Psorophora ciliata (Fabr.)), Warden's "Culex pipiens L." may have consisted of a complex of a number of species. In 1868 Baron Osten Sacken described Aedes sapphirinus, now Uranotaenia, with Washington, D. C. as a type locality, thus giving the District of Columbia its first definite specific mosquito record. The District of Columbia is likewise the type locality for Orthopodomyia signifera (Coquillett) 1896, the type of which

is preserved in the U.S. National Museum.

Lists of mosquitoes including records of specimens collected in the District of Columbia were published by Howard in 1896, 1900, and 1901, by Howard, Dyar, and Knab 1915–1917, and Dyar 1922. These papers listed 9, 13, 10, 26 and 23 species respectively from the District of Columbia. Because of the inevitable changes in synonymy it is difficult to determine in each case from the published data just which of our present day species were represented in the collections of these writers. Fortunately, most of these, as well as many unreported specimens, are preserved in the collection of the U. S. National Museum. This collection contains specimens of 31 species of mosquitoes from the District of Columbia which were collected

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¹The writer wishes to express his appreciation to Dr. Alan Stone, U. S. Bureau of Entomology and Plant Quarantine, for making final identifications of all of the specimens specifically listed in this paper and for his ever available aid in all phases of the work, and to Dr. E. A. Chapin and Mr. C. F. W. Muesebeck for giving permission to publish records of the specimens in the collection of the U. S. National Museum and for making available a microscope and working space during the winters of 1942–43 and 1943–44. The majority of the original identifications of the 1942 and 1943 collections were made by Asst. Sanitarian (R) John E. Porter who was assigned to the District of Columbia office from September 1942 to August 1943. The 1942–45 collections were made by MCWA entomologists and inspectors, particularly Engineering Aide, C. W. Travis.

prior to 1915. With one questionable exception it contains representatives of all species reported from the District of Columbia by either Howard, Dyar, and Knab 1915-1917 or Dyar 1922, with the addition of Aedes canadensis (Theob.), A sollicitans (Walk.), A. sticticus (Meig.), and A. taeniorhynchus (Wied.). There is also a single male of Orthopodomyia. collected in 1901 and originally determined as O. signifera (Coq.), which agrees with Baker's description of O. alba (1936) and must be referred to this species. The single exception is that of Wyeomyia smithii (Coq.) 1901, which is reported by Howard, Dyar, and Knab 1915, p. 101, as having been collected in Washington, D. C. by Miss Evelyn G. Mitchell as, "larvae in pitcher plant leaves in a green house." No date is given, and no records are available to prove that the pitcher plant in question had not been brought in recently from some other locality, with the eggs or larvae already in its leaves. The only existing specimens to which the above data could refer are preserved in alcohol in the collection of the U.S. National Museum. One vial labeled, "W. smithii, D. C., June 16", contains two pupae only. Three other vials labeled simply, "W. smithii", in handwriting identical with that of the first vial, contain many larvae of W. smithii but there is no further data. or may not be from the same lot as the first vial which again may or may not contain the specimens referred to by Howard, Dyar, and Knab. However, since Sarracenia purpurea L. has been taken within the District of Columbia, as proven by specimens in the U.S. National Herbarium, and the known range of W. smithii surrounds this area, we consider this species to have been definitely recorded here.

The years 1914 to 1942 appear to have produced no new District of Columbia species records which can be corroborated either by specimens or by records of determinations by specialists. General mosquito control work was carried on in the District of Columbia from 1930 to 1941, (see Robertson 1932-33, and Stephens and Fisher 1939) and many specimens were collected but few of these were preserved. During this same period, in 1932-33, specimens collected at a light trap in College Park, Maryland, three miles northeast of the District of Columbia and reported by Cory, et al, 1934, showed that four additional species should be present here. These were Aedes cinereus Meig,. Aedes mitchellae (Dyar), Culex erraticus D. & K., and Culiseta melanura (Coq.). In addition, Anopheles barberi Coq. was taken repeatedly on Plummers Island, Maryland (type locality) four miles west of the District of Columbia, and at other points near the Potomac River in Montgomery County, Maryland. All of these species, as well as 27 other opecies already represented in the U.S. National Museum collections and including Orthopodomyia alba Baker, have since been taken in the District of Columbia by the writer and his assistants. The addition of these five species raises the total number of species definitely recorded from the District of Columbia to 37. Of these, 33 species have been taken within the past five years and so are considered to be a part of the present District of Columbia fauna. There are no records of Aedes aegypti (L.), Psorophora discolor (Coq.), Psorophora horrida (D. & K.) nor Wyeomyia smithii (Coq.) during the past thirty years and they therefore must be considered to be either extinct or extremely rare as far as the District of Columbia fauna is concerned. Aedes aegypti, the yellow fever mosquito, may be of course reintroduced at any time and could propagate during the summer so a continual watch must be kept for this dangerous species.

Three other species, not definitely recorded from within the District of Columbia, have been taken in nearby Maryland or Virginia, or both north and south of these states, and must be listed as of probable occurrence. These are Aedes grossbecki D. & K. collected at Grassymead (Fairfax Co.?), Virginia, June 19, 1906, and at Baltimore, Maryland (specimens in U. S. National Museum); Aedes dupreei (Coq.), known from both New Jersey and Lake Drummond, Virginia (Dorer, et al., 1944) as well as from other more distant localities; and Aedes cantator (Coq.), a strong-flying salt marsh mosquito, similar in appearance to the very common A. vexans, and recorded by Corv. et al. to be common at Annapolis and Chesapeake Beach, Maryland, both less than 30 miles, air-line distance, from the District of Columbia.

The present Malaria Control in War Areas program has carried on an extensive entomological inspection in all parts of the District of Columbia since June 1942, under the continuous direction of the writer. Collections were made by means of light traps, natural and artificial resting places, biting records, and by dipping for larvae. During these three seasons 32 species were collected in the adult stage and 26 of these species were taken also as larvae. Five species were taken for the first time in the District of Columbia and a great deal of information on general abundance, seasonal abundance, and larval habitats has been gained.

Specific records on rare or unreported species, together with the larval habitats of specimens taken in the District of Columbia are given below. The following abbreviations and symbols are used: (T)—light trap; (S)—natural or artificial resting station; (R)—adult reared from larva or pupa; (B)—biting records; (L)—larva. Some, or all, of the specimens listed in each record are deposited in the U.S. National Museum.

All records from 1942-1945 are based on specimens collected by Malaria Control in War Areas personnel unless otherwise indicated.

Aedes aegypti (L.)

Dist. Col.: 3 & S., July 3, 1901, J. Carroll; 1 9, Aug. 28, 1908, R. W. Van Horn; 1 S., Sept. 1, 1908, R. W. Van Horn.

Aedes atlanticus D. & K.

Chain Bridge, 1 \, \text{, Sept. 29, 1906, T. Pergande; 10th & G St., S. W.; (T) 2 \, \text{d}, 1 \, \text{, Aug. 21, 1942, 1 \, d}, 2 \, \text{q}, Aug. 24, 1942; (L) 4, June 14, 1945, in shallow, shaded pond, N. E. Good.

Aedes atropalpus (Coq.)

This species is quite common in the area near Chain Bridge between the old C. & O. Canal and the Potomac River, where larvae may be found throughout the summer in pot holes in rocks. Larvae also were taken on one occasion in water in a fire barrel on a temporary bridge; Roosevelt Island, (L), 2, Sept. 23, 1942, J. E. Porter. Adults seldom have been taken more than one-fourth mile from known breeding places.

Aedes canadensis (Theob.)

Larvae of this species are the first to appear in the spring and are the most common species until the first part of May. They gradually are replaced by larvae of *Aedes vexans* and disappear in early June. They breed in shallow semipermanent ponds, particularly those in open fields, throughout the District of Columbia. (L), 50, Apr. 9, 1943, N. E. Good.

Aedes cinereus Meig.

Between Anacostia River and National Training School for boys; (L) 4, Apr. 16, 1943, J. E. Porter, in swampy ponds; (B), $3 \circ \circ$, May 26, 1943, J. E. Porter; (S), $1 \circ$, May 26, 1943.

Aedes mitchellae (Dyar)

Zoo, (T), 1 &, May 11, 1944, 2 & Q, May 20, 1944, 1 Q, July 13, 1944, 1 Q, Aug. 2, 1944, 1 Q, Oct. 7, 1944. A single female was taken between May 13 and May 27, 1944 in light traps at each of the following places: American University, Rock Creek Park, Army Medical Center, Hains Point, and Camp Simms. The Army Medical Center specimen was the first to be identified, this determination being made by S/Sgt. (now 1st Lieut., Sn.C.) D. Millspaugh of the Army Medical School, A. M. C.

Aedes sollicitans (Walk.)

Adult females of the salt marsh mosquito are taken commonly in light traps throughout the District of Columbia. Males also are taken, but less commonly and in the District of Colum-

bia always have been confined to the eastern half. Larvae have been taken on a few occasions in small temporary ponds in the eastern half of the District. Saratoga and Montana Avenues, N. E., (L), I, Aug. 13, 1942, in temporary pond; Bladensburg Rd. & 28th St., N. E., I, Aug. 17, 1942, in temporary pond; Oklahoma Avc. & C St., N. E., I, Aug. 21, 1942, in shallow temporary pond; Anacostia Park near Anacostia bridge, 1, Aug. 22, 1942, in shallow semipermanent pond.

Aedes sticticus (Meig.)

We have only two records of the floodwater mosquito in the District of Columbia; 1 ♂, May 18, 1914, F. Knab, in house; 17th and R. l. Ave., N. E., (T) 2 ♀ ♀, May 16, 1940 (D. C. Mosquito Control).

Aedes taeniorhynchus (Wied.)

Adult females are taken occasionally but males never have been taken. We have two larval records: (L), 1, Sept. 1902, J. Kotinsky; north of Naval Air Station, 1, Oct. 22, 1942, in shallow pond.

Aedes triseriatus (Say)

This species is found rather commonly throughout the District of Columbia breeding in tree holes, in bird baths on the ground in sheltered locations, and in water in barrels, buckets, and other containers.

Aedes trivittatus (Coq.)

Adults are taken occasionally in light traps throughout the District of Columbia, but most of our records are from a light trap at Minnesota Ave. and Hunt Place N. E. in 1942. We have only two larval records; Rock Creek Park, 2, Aug. 12, 1942, in shallow woodland ponds; West Va. Ave., & Fenwick St., N. E., (R), 2 \, \circ, Sept. 3, 1942, from woodland pool.

Aedes vexans (Meig.)

This is the most common species of Aedes in the District of Columbia and ranks second only to Culex pipiens in total numbers. It is especially numerous and troublesome after heavy summer rains. Larvae are found throughout the season in temporary rain-filled pools and shallow ponds where they often are seen in groups of several thousand. Sometimes there may be several separate groups in the open water of a pool well away from the banks and from emergent and floating vegetation.

Anopheles barberi (Coq.)

This rare species was originally described in 1903 from Plummers Island, Maryland, in the Potomac River four miles west of the District of Columbia. However, there were no District of Columbia records of this species until 1943 when nine males and six females were taken by M. C. W. A. personnel in natural resting places in Rock Creek Park, the Soldiers Home, and the Kenilworth aquatic gardens. Kenilworth, (S), 1 \(\frac{1}{2}\), July 2, 1943; Soldiers Home, 2 \(\frac{1}{2}\), July 3, 1943; Rock Creek Park, (L), 1, Aug. 12, 1944, N. E. Good, in small, shaded, tree hole. Larvae also have been collected by personnel of the Army Medical Center in tree holes in Rock Creek Park from August 1 to September 8, 1944.

Anopheles crucians, (Wied.)

This species is present but not very common in the District of Columbia. It is taken much more frequently in light traps than by other methods of collecting. The larvae breed in large lily ponds with dirt banks, in old borrow pits now bordered by vegetation, and in other types of unshaded ponds containing or bordered by vegetation. It usual habitats seem to be much the same as those of A. quadrimaculatus and we often have taken the two together. All of the larvae have been of the typical sub-species, A. crucians crucians.

Anopheles punctipennis (Say)

This is by far the most common species of Anopheles in the District of Columbia, and one of the most common of all species of mosquitoes here. The larvae breed in a great variety of habitats including nearly all types of ponds and streams, from sunlit ponds to woodland streams. The adults of this species are very commonly found biting out of doors in the evening.

Anopheles quadrimaculatus Say

The common malaria mosquito is present in small numbers throughout the District of Columbia in lily ponds, old borrow pits and other quiet, sunlit pools, especially those with floating aquatic vegetation, but is not very numerous at any place. A breeding place in the water chestnut of Oxon Creek was eliminated by cutting in early 1943 and breeding in the old C. & O. canal during the summer of 1943 has been eliminated by the repairing and restoration of the canal. The main breeding areas at present are a number of large ornamental pools in Kenilworth and in the National Arboretum, in all of which breeding is kept in check by large numbers of top minnows, Gambusia sp.

Anopheles walkeri Theob.

Adults of A. walkeri have been taken in rather large numbers in light traps at Kenilworth and at Blue Plains, and in smaller numbers elsewhere. Larvae have not been taken but undoubtedly do breed in the swampy areas near Kenilworth and Blue Plains.

Culex apicalis Adams

Larvae of *C. apicalis* are found commonly throughout the District of Columbia in various types of ponds and small creeks.

Culex erraticus D. & K.

Although *C. erraticus* is a common species in the District of Columbia it never previously has been reported here. The larvae breed in lily ponds and other quiet, sunlit ponds with floating aquatic plants, frequently being found associated with *A. quadrimaculatus* and *Uranotaenia sapphirina*. C. & O. Canal near Chain Bridge, (L), 2, July 16, 1942; Oxon Creek in water chestnuts, 2 Sept. 2, 1942; North of National Arboretum, 4, Sept. 22, 1942, in large pond; Gallinger Hosp., (T), 1 \, Sept. 19, 1943.

Culex pipiens L.

The northern house mosquito is the most abundant species of mosquito in the District of Columbia. It breeds almost anywhere that water stands, whether in ponds, sluggish streams, or artificial containers. It is especially numerous in catch basins, stagnant ponds, and in other places where the water is slightly polluted, and, except in rainy seasons, is the cause of more annoyance than any other species.

Culex quinquefasciatus Say

The southern house mosquito is fairly common in the District of Columbia as is shown by approximately one hundred specimens in the U. S. National Museum. In collections made by Malaria Control in War Areas personnel, *C. quinquefasciatus* was not separated from *C. pipiens* after it had been determined that *C. pipiens* was much the more common species.

Culex restuans Theob.

The white-dotted *Culex* is very common although not as common as *C. pipiens*. It breeds in much the same type, and in almost as great a variety of habitats as *C. pipiens* but is not nearly as common in street catch basins.

Culex salinarius Coq.

This species is found in moderate numbers breeding in ponds of various types.

Culiseta inornata (Will.)

This species has been taken occasionally throughout the District of Columbia. The larvae occur in small semipermanent ponds, rain-water ponds, and hoof prints. Langdon Park, (L), 1, Sept. 4, 1942, pool in small stream, Hains Point, 13, March 19, 1945, in old borrow pits.

Culiseta melanura (Coq.)

Only one District of Columbia specimen of *C. melanura* is available: Gallinger Hosp., (T), 1 \, May 19, 1943.

Mansonia perturbans (Walk.)

Taken in light traps in moderate numbers throughout the District of Columbia, particularly at the Kenilworth aquatic gardens. No serious attempt has been made to collect the larvae.

Megarhinus septentrionalis D. & K.

Specimens from the District of Columbia formed part of Dyar and Knab's type series but there were no definite records of larvae collected until 1944. Larvae and pupae were collected in tree holes in Rock Creek Park, usually associated with either Aedes triseriatus or Anopheles barberi, from June 2 through September 1944 by Army Medical Center personnel, and from August 12 to October 7, 1944 by N. E. Good. Rock Creek Park, (L), 1, Aug. 12, 1944: 2, Aug. 26, 1944; (R), 1 , Aug. 23, 1944; 1 , Sept. 15, 1944, N. E. Good, all collected as larvae in tree holes.

Orthopodomyia alba Baker

Dist. Col.: 1 &, July 20, 1901, N. Banks (originally determined as *O. signifera*); (T), 14th & R. I. Ave., N. E., 1 &, Sept. 4, 1942; 1 &, Aug. 20, 1943; National Arboretum, 1 &, Sept. 18-25, 1943.

Orthopodomyia signifera (Coq.)

The District of Columbia is the type locality for *O. signifera* but it is rather rare here nevertheless. The following larval specimens have been taken: (L), 1, July 1904, H. G. Dyar; Soldiers Home, 10, Sept. 11, 1942, in unused metal horse trough.

Psorophora ciliata (F.)

Taken occasionally in light traps, particularly in the south-eastern part of the District of Columbia. Larvae have been taken only twice in the District of Columbia. Chain Bridge, (R), 1 \, Aug. 9, 1908; Blue Plains, between Home for Aged and Oxon Creek, (L), 6, Aug. 19, 1942, in shallow temporary ponds.

Psorophora confinnis (Arrib.)

Taken commonly throughout the District of Columbia in light traps, but especially at Camp Simms and at St. Elizabeth Hospital. The larvae live in shallow ponds, puddles, and road ruts.

Psorophora discolor (Coq.)

There are only two records of *P. discolor* in the District of Columbia. In both cases the specimens were taken as larvae and reared. Data on these specimens in the U. S. National Museum is as follows: 1 \(\rightharpoonup, \quad "Raised from larva coll, at Mt. Pleasant, D. C., on Sept. 8, 01, Iss. Sept. 9, 01, Kotinsky"; 1 \(\sigma, \quad "Washington, D. C., Iss. V-24, H. G. Dyar".

Psorophora ferox (Humb.)

Taken occasionally throughout the District of Columbia by all methods of collection. On a few occasions it has been observed to be numerous and a persistent biter in swampy, wooded places during the day. The larvae breed in swampy ponds, woodland pools, and small marshy creeks.

Psorophora horrida (D. & K.)

Our only records, in addition to published records, consist of four specimens in the U. S. National Museum with data as follows: 2 \(\phi \), "Catholic Univ., D. C., VII-05, T. Pergande"; 1 \(\phi \), "Washington, D. C., 5-VII-08, F. Knab"; 1 \(\phi \), "Chain Bridge, D. C., July 21, 09".

Psorophora howardii (Coq.)

One male in the U. S. National Museum collection is labeled "Chain Bridge, D. C., Iss., Aug. 2, 08, T. Pergande". We have one additional record: Roosevelt Island, (B), 6 9 9, Aug. 26, 1942.

Uranotaenia sapphirina (O.S.)

Taken rather commonly throughout the District of Columbia in light traps and in larval collections. It is particularly numerous at the Kenilworth aquatic gardens. The larvae breed in the same habitats and in company with *Anopheles quadrimaculatus*. They are common in ornamental pools, ponds with floating aquatic vegetation, and among water chestnut in Oxon Creek.

Wyeomyia smithii (Coq.)

The single record of this species has been discussed on page 2.

The following table lists the indicated abundance of each species, the earliest and latest known seasonal collection records, and the oldest existing District of Columbia specimen of each species. These records are based in each instance on specimens now deposited in the U. S. National Museum and determined by Dr. Alan Stone.

EXPLANATION OF SYMBOLS USED IN TABLE.

Abundance Column.

- 1—Very abundant (breeds throughout season in a variety of habitats throughout District of Columbia).
- 2—Common.
- 3-Scarce to fairly common.
- 4-Rare.

a-present only in the spring.

b-breeds only in restricted habitats and the adults are of local distribution.

c-no recent records.

Recorded seasonal occurrence columns.

Source or records:

a-collections of M.C.W.A., 1942-1944.

b-specimens in U. S. National Museum.

c-other collections or unpublished records.

d-published records, for which specimens are not available.

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THE NORTH AMERICAN SPECIES OF THE GENUS ISOCHAE-TOTHRIPS MOULTON (Thysanoptera, Thripidae)

By J. C. Crawford, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture

To this genus must be assigned *Dictyothrips reticulatus* D. L. Crawford; and as I find no characters in the description of *Isochaetothrips dampfi* Priesner by which these two can be

separated, the latter is omitted from the key.

With the exception of *davidsoni* Moulton, where the sculpture is not mentioned, all the described North American species have the head and prothorax above with very fine and close, transverse, anastomosing striae, well illustrated in Crawford's original description of *reticulatus*.

Key to Females

1.	Body yellow, with a median, longitudinal brown stripe	
	gardeniae, new species.	
	Body entirely brown	2
2.	Wings brown, clear basally	
	Wings brown, without a basal hyaline band	3
3.	Pronotum with 5 pairs of posterior marginal setae, of which the second	
	and fourth are longer	
	Pronotum with 3 pairs of posterior marginal setae, the inner pair longest	
	striatus Hood.	